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THE GENUS *DINOFELIS* (CARNIVORA, MAMMALIA) IN THE BLANCAN OF NORTH AMERICA

by

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The Genus *Dinofelis* (Carnivora, Mammalia) in the Blancán of North America

Björn Kurtén*

INTRODUCTION

The Blanco fauna was described by Meade (1945), who created the new felid species *Panthera palaeoonca*, based on a skull and associated mandible. Comparing the new species with members of the genera *Panthera* and *Felis*, he concluded that it showed close affinity to the jaguar. This has been tentatively accepted by later workers (Savage, 1960). The species forms the basis for the record of the genus *Panthera* in the Blancan of North America.

A restudy of the material in 1971 led to the discovery in the collections of the Texas Memorial Museum at the University of Texas at Austin, of an additional, better preserved specimen (an upper canine) which clearly did not belong to *Panthera* or *Felis* but showed close affinity to the genus *Dinofelis* which has hitherto only been recorded from the Old World. Checking back on the type skull and mandible, the reference to *Dinofelis* could be fully substantiated.

I wish to express my gratitude to Drs. John A. Wilson and Ernest L. Lundelius, the University of Texas at Austin, for the opportunity to study collections in their care.

The abbreviation TMM is used to signify collections of the Texas Memorial Museum, the University of Texas at Austin. These were formerly in the collections of the Bureau of Economic Geology and in previous reports bore the prefix BEG.

Genus *Dinofelis* Zdansky

Dinofelis Zdansky, 1924
Therailurus Piveteau, 1948
Dinofelis Zdansky, Hemmer 1965 (see this paper for more detailed synonymy).

Type species: *Dinofelis abeli* Zdansky 1924

Diagnosis: Large Felidae with somewhat flattened, moderately enlarged, fairly straight upper canines; lower canine moderately reduced; incisors in shallow arch; no P^2; cheek teeth relatively slender; P_3 tending to reduction; P_4 with large accessory cusps; short postorbital processes; zygomatic arch relatively shallow; large mastoid process; mandible with slightly or moderately reduced coronoid process and with ventral border deflected downward to angle; upper border of ramus rising steeply from P_3 to canine.

Dinofelis palaeoonca (Meade)

Panthera palaeoonca Meade, 1945

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Type: TMM 31181-192, skull and mandible (Meade, *op. cit.*, pl. 48, figs. 1, 2; pl. 49.

Referred: TMM 31176-63, fragment of P^4; TMM 31176-4, right upper canine (fig. 1).

Locality and horizon: Blanco beds, Crosby County, Texas; type from head of Blanco Canyon, Locality 31181, Site 11; referred specimens from Locality 31176, Site 6.

Age: Blancan.

Diagnosis: A *Dinofelis* slightly smaller than *D. diastemata* (Astre); frontals higher than occiput; P^4 without distinct ectoparastyle; mandibular diastema short; P_3 moderately reduced; M_1 with small talonid.

DISCUSSION

The type skull of "*Panthera*" *palaeoonca* unfortunately is badly cracked and deformed, and this, as Meade (1945) noted, makes it difficult to study the various elements in relation to each other, and to compare them with other species. Still, a number of characters deviate significantly from the norm in the genus *Panthera,* and tend to ally this form to the *Dinofelis* group.

The upper canines in the type are badly cracked and puffed up, which tends to mask their characteristics. Fortunately, a well preserved isolated canine has come to light in the Blanco collections. This is TMM 31176-4, which comes from the same site as the carnassial fragment referred by Meade to this species. The canine, which is of the same size as that in the type skull, is markedly flattened and saber-like in comparison with the *Panthera* canine (see comparative measurements in table 1). It has smooth sides, lacking the grooving so characteristic of *Felis* and *Panthera.* Both the front and hind edges are keeled, but there is no crenulation. The canine thus is quite different from its homologue in *Panthera,* and compares closely with *Dinofelis.* It differs, on the other hand, from true saber-tooths like *Homotherium* (= *Dinobastis*), *Machairodus,* and so on, by its relative straightness and moderate crown height, and the absence of crenulation.

The genus *Dinofelis* was revised by Hemmer (1965), who showed that, in addition to the type species *D. abeli* from China, it should include the species *D. diastemata* (Astre) from Europe and *D. piveteaui* (Ewer) and *D. barlowi* (Broom) from Africa. The three latter species had previously been placed in a separate genus, *Therailurus,* which as Hemmer shows, falls into the synonymy of *Dinofelis.*

Hemmer lists a number of distinctive characters for the genus. Owing to the poor preservation of the Blanco specimen, not all of them could be studied in the present case; on the other hand, I have added some characters that seem important. In addition to Hemmer's study, my comparisons are based on original studies of the following Old World specimens of *Dinofelis:*

University of Uppsala, Paleontological Institute: *Dinofelis abeli*, type skull and mandible (Zdansky, 1924, pl. 31, figs. 1-4). The specimen comes from Locality B in Honan, northern China, and is of post-Pontian age, not Pontian as assumed by Hemmer (1965).

University of Lyon, Institute of Geology and Paleontology: *Dinofelis diastemata,* p. 29, cast of type skull (original in Astre, 1929, figs. 1-3). The original comes from Perpignan, France, and is Astian in age.

Measurements of these specimens are given in table 1, which also lists comparative measurements of a Recent specimen of *Panthera onca:* University of Cambridge Museum of Zoology No. K 5782 (from Guatemala).

The following is a listing of a number of salient characters in *Dinofelis palaeoonca (D.p.),* in Old World species of *Dinofelis (D.),* and in *Panthera onca (P.o.).*

SKULL

D.p.	Frontalia higher than occiput
D.	Frontalia and occiput at same level or occiput slightly higher
P.o.	Frontalia slightly higher than occiput
D.p.	Crista sagittalis and lambdoidea well developed
D.	Crista sagittalis and lambdoidea well developed
P.o.	Crista sagittalis and lambdoidea well developed
D.p.	Postorbital processes short
D.	Postorbital processes short
P.o.	Postorbital processes relatively long
D.p.	Zygomatic arch relatively shallow, especially hind part
D.	Zygomatic arch relatively shallow, especially hind part
P.o.	Zygomatic arch deeper, especially hind part
D.p.	Mastoid process well developed
D.	Mastoid process well developed
P.o.	Mastoid process less developed
D.p.	Incisors forming shallow arch
D.	Incisors forming shallow arch
P.o.	Incisors in transverse line

TEETH

D.p.	Incisors relatively large
D.	Incisors relatively large
P.o.	Incisors relatively small
D.p.	Upper canine long, narrow, high-crowned, flattened with smooth sides; front and hind edge keeled but not crenulated
D.	Same as above
P.o.	Upper canine stout, grooved, with feebly keeled edges lacking crenulation
D.p.	No P^2
D.	No P^2
P.o.	P^2 present
D.p.	P^3 with short but high main cusp
D.	P^3 with short but high main cusp
P.o.	P^3 with longer main cusp
D.p.	P^4 without distinct ectoparastyle; metastyle relatively short

D. P^4 with or without distinct ectoparastyle; metastyle relatively short
P.o. P^4 without distinct ectoparastyle; metastyle relatively longer
D.p. Lower canine markedly smaller than upper
D. Lower canine markedly smaller than upper
P.o. Lower canine only slightly smaller than upper
D.p. P_3 somewhat reduced
D. P_3 moderately to strongly reduced
P.o. P_3 fairly large
D.p. P_4 slender with short but high main cusp and large secondary cusps
D. P_4 slender with short but high main cusp and large secondary cusps
P.o. P_4 stouter with longer main cusp and shorter secondary cusps
D.p. M_1 slender with small talonid
D. M_1 slender, mostly without talonid
P.o. M_1 stouter, mostly with small talonid

MANDIBLE

D.p. Ventral border of mandible deflected downward to angle
D. Ventral border of mandible deflected downward to angle
P.o. Ventral border of mandible nearly straight
D.p. Diastema of medium length, border of mandible rises steeply from P_3 to C
D. Diastema long, border rises steeply
P.o. Diastema of medium length, border almost horizontal

The list shows the Blancan form to agree with *Dinofelis* in the majority of the characters in which that genus differs from *Panthera*; the few exceptions are of minor importance but probably suffice to validate *palaeoonca* as a distinct species within *Dinofelis.* It would seem to be a relatively primitive species within that genus, perhaps closer to *D. diastemata* than to *D. abeli* (in which P_3 is much more reduced), and definitely less specialized than the Pleistocene forms in southern Africa.

Hemmer (1965) discusses the probable ancestry of *Dinofelis* and points to important resemblances to the Oligocene *Nimravus* of Europe and North America (see Toohey, 1958), in which, however, the dentition is much more primitive. In dental characters *Dinofelis* is rather close to the *Pseudaelurus-Metailurus* group (see Zdansky, 1924), but the skull of these last-mentioned felids does not show any close approximation to the type seen in *Dinofelis.* It should be remembered, however, that the species of *Dinofelis* are much larger than any members of the *Pseudaelurus* group and that some of the differences may be due to allometric growth.

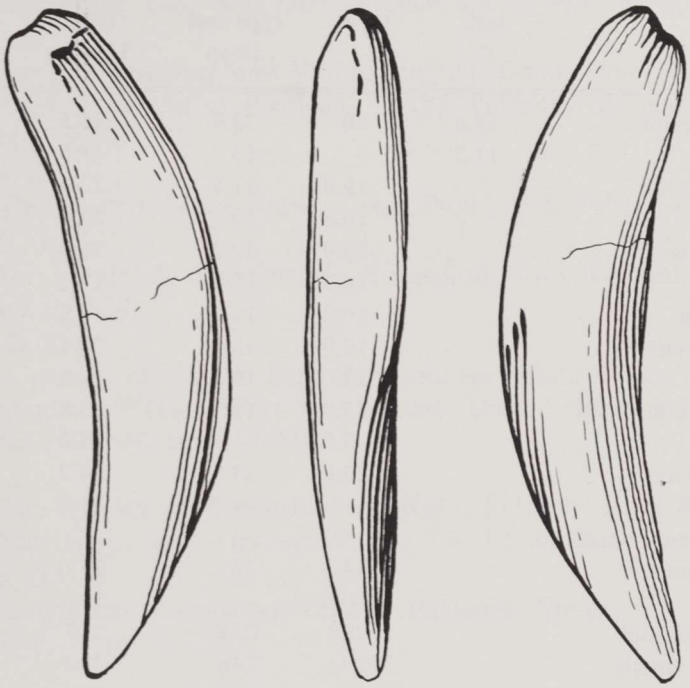

Fig. 1.—*Dinofelis palaeoonca* (Meade), right upper canine. X1

TABLE 1

Skull and dental dimensions in *Dinofelis* and in *Panthera onca*

	Dinofelis palaeoonca isol. C	*Dinofelis palaeoonca* type	*Dinofelis diastemata* type cast Lyon	*Dinofelis abeli* type Uppsala	*Panthera onca* K 5782
C^s anteroposterior	18.6	ca. 20	23½	26.5	18.1
– transverse	11.7	–	13	17.5	14.4
P^3 anteroposterior		19.8	21.5	23.4	17.0
– transverse		10.8	10	11.0	9.0
P^4 anteroposterior		33.4	32.2	36.3	26.7
– transverse		16.5	15.5	17.1	13.5
– blade width		10.8	11.0	11.3	9.6
C_1 anteroposterior		14.9	15.0	20.1	18.0
– transverse		11.0	10.5	14.5	13.2
P_3 anteroposterior		15.0	16*	13.8	14.5
– transverse		7.9	–	8.0	7.3
P_4 anteroposterior		23.0	23	24.7	18.9
– transverse		–	–	11.0	8.8
– main cusp anteroposterior		9.3	–	–	8.8
M_1 anteroposterior		24.3	24	27.0	20.2
– transverse		10.0	–	13.3	10.5
Basal length of skull		208	231	267	214
Condylobasal length		222	246	280	227
Zygomatic width		ca. 145	169	–	170
Mastoid width		88	93	–	103
Width of muzzle at canines		ca. 63	64½	–	72
Bicondylar width		50½	48.5	–	48.7
Height of zygoma at orbit		28.4	30.7	–	29.8

*Measurements of mandibular teeth from Hemmer (1965)

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